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Supplemental Material

Humoral Immunity in Arsenic Exposed Children in Rural Bangladesh: Total Immunoglobulins and Vaccine-Specific Antibodies

Rubhana Raqib, Sultan Ahmed, Khalid Bin Ahsan, Maria Kippler, Evana Akhtar, Anjan Kumar Roy, Ying Lu, Shams El Arifeen, Yukiko Wagatsuma, and Marie Vahter

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Table S1: Descriptive statistics of exposures and outcomes by different supplementation groups

Variables ^a	30Fe400F(n=181)	60Fe400F (n=181)	MM (n=163)	P
U-As (µg/L) ^b at GW8	99 (2-1626)	67 (4-1575)	84 (7-2063)	0.378
U-As (µg/L) ^b at 4.5 years	58 (13-1228)	60 (16-697)	56 (12-761)	0.732
U-As (µg/L) ^b at 9 years	49 (9-619)	56 (14-1268)	58 (9-695)	0.480
tIgG (mg/dL)	1344 (144-2251)	1322 (709-2299)	1299 (448-2004)	0.665
tIgE (IU/mL)	726 (19-11929)	712 (5-7886)	776 (23-9367)	0.929
tIgA (mg/dL)	123 (31-375)	127 (44-252)	128 (48-256)	0.932

Abbreviations: 30Fe400F, 30 mg iron plus 400 µg folic acid; 60Fe400F, 60 mg iron plus 400 µg folic acid; MM, the UNICEF preparation of 15 different micronutrients including 30 mg iron and 400 µg folic acid; U-As, Urinary arsenic; GW, gestational week

^aValues shown are median (range)

^bAdjusted to average specific gravity of 1.012

P values were calculated using Kruskal-Wallis test

Table S2: Descriptive statistics of measles, mumps and rubella vaccine-specific plasma IgG in children at 9 years of age.

Variables ^a	All children (N=525)	Boys (N=258)	Girls (N=267)	P
Measles-specific IgG (U/mL)				
Pre-immunization	1428 (123, 35277)	1550 (122, 32693)	1373 (279, 35277)	0.712
Post-immunization	3346 (721, 91407)	3282(721, 89141)	3400 (1231,91407)	0.349
Mumps-specific IgG (U/mL)				
Pre-immunization	7511 (243, 316830)	6305 (243, 150538)	8239 (268, 316830)	0.118
Post-immunization	20561 (1171, 295545)	19610 (1171, 109588)	22502 (1218, 295545)	0.391
Rubella-specific IgG (IU/mL)				
Pre-immunization	6436 (2,405042)	4891 (1, 405042)	6727 (2, 143558)	0.420
Post-immunization	9810 (6, 384021)	8500 (41, 384021)	10962 (6, 133244)	0.086

Abbreviations: tIg, total plasma immunoglobulin

^aValues shown are median (range).

P values were calculated using Mann-Whitney U test between boys and girls.

Table S3: Regression analysis of associations of arsenic exposure (log₂-transformed U-As) with measles and rubella-specific post-immunization plasma IgG (log₂-transformed) in the lowest quartile of measles and rubella-specific pre-immunization IgG concentrations.

	Lowest quartile of pre- immunization measles-specific IgG (U/ml); median (range), 558 (122- 769); P values
	β(95% CI)
U-As at GW8 ^a	-0.0005 (-0.08, 0.08); 0.991
U-As at 4.5 years of age ^a	0.049 (-0.05, 0.15); 0.336
U-As at 9 years of age ^a	-0.02 (-0.11, 0.08); 0.679
	Lowest quartile of pre- immunization rubella-specific IgG (IU/ml); median (range), 7 (1-11)
U-As at GW8 ^a	-0.006 (-0.14, 0.13); 0.925
U-As at 4.5 Years of age ^a	-0.08 (-0.27, 0.13); 0.458
U-As at 9 years of age ^a	-0.009 (-0.21, 0.19); 0.928

Abbreviations: U-As, sum of urinary arsenic metabolites; β, regression coefficient; CI, confidence interval; GW, gestational week.

^aAdjusted for child HAZ (exposure time specific), SES (exposure time specific), season of blood collection, sex, and plasma concentrations of CRP.

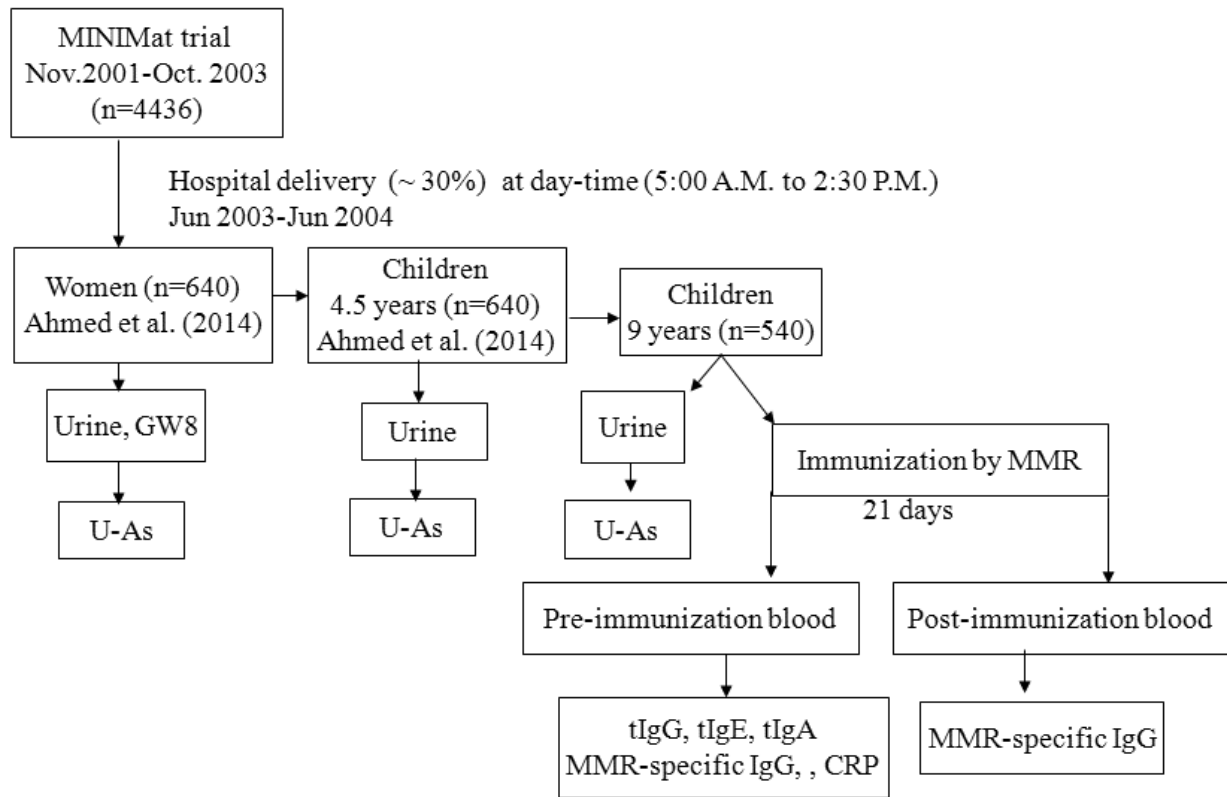


Figure SI: Flow chart describing the enrolment of mother-child pairs in the current study, including exposure and outcome measures.

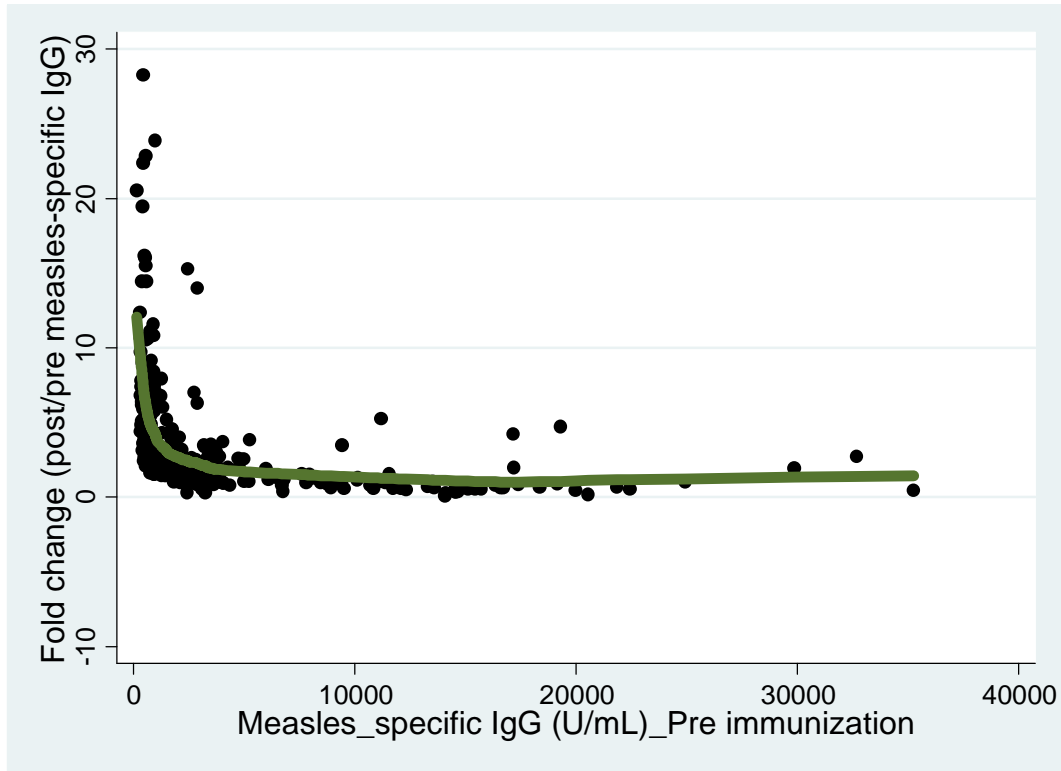


Figure S2: Illustration of the fold change in measles-specific plasma IgG (post-immunization IgG/pre-immunization IgG) at different pre-immunization measles-specific plasma IgG titers in children at 9 years of age. The green line represents a Lowess (locally weighted scatter plot smoothing) moving-average curve.

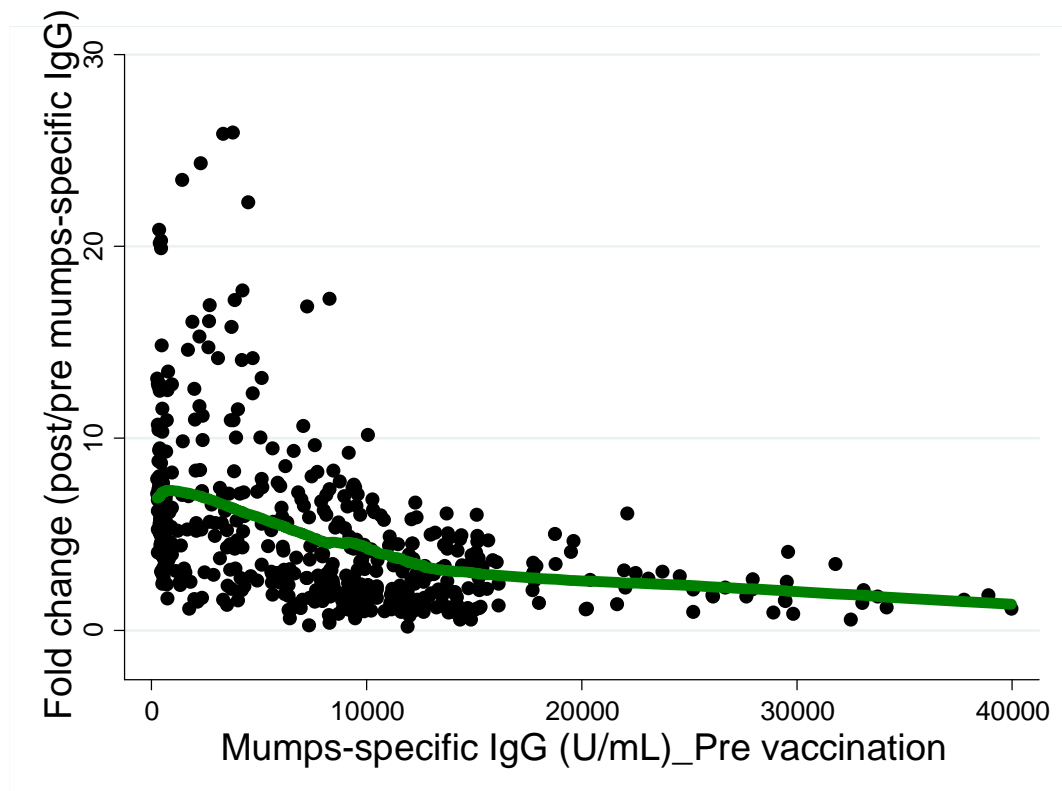


Figure S3: Illustration of the fold change in mumps-specific plasma IgG (post-immunization IgG/pre-immunization IgG) at different pre-immunization mumps-specific plasma IgG titers in children at 9 years of age. The green line represents a Lowess (locally weighted scatter plot smoothing) moving-average curve.

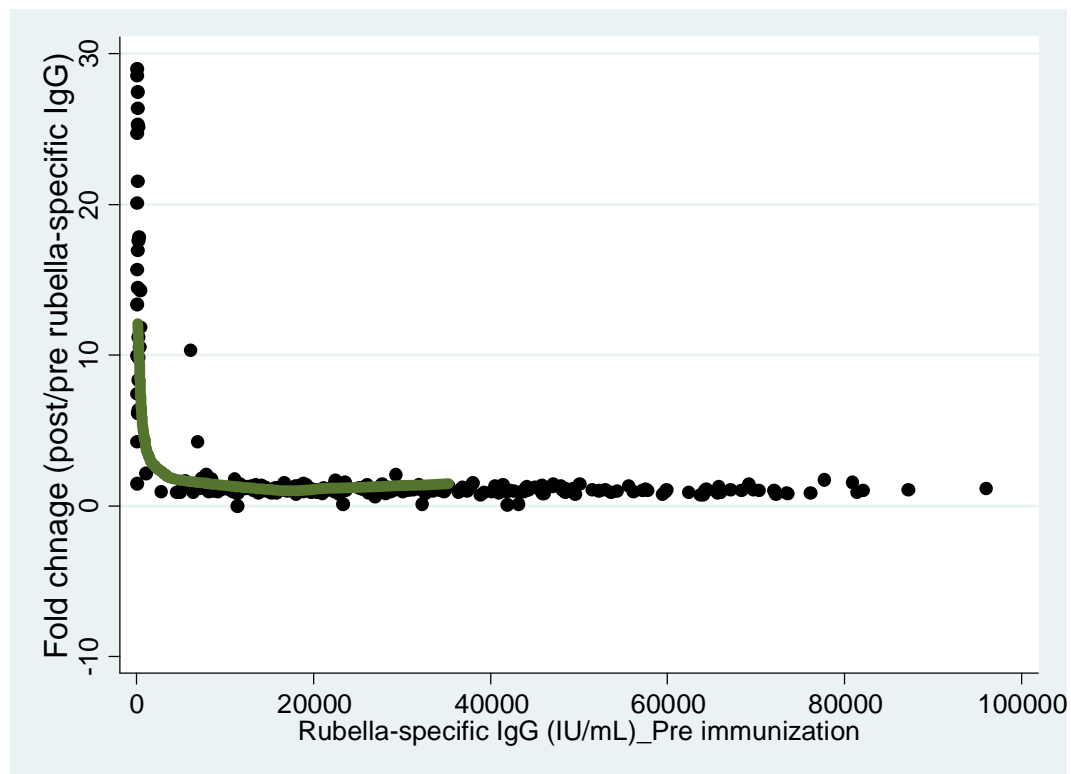


Figure S4: Illustration of the fold change in rubella-specific plasma IgG (post-immunization IgG/pre-immunization IgG) at different pre-immunization rubella-specific plasma IgG titers in children at 9 years of age. The green line represents a Lowess (locally weighted scatter plot smoothing) moving-average curve.